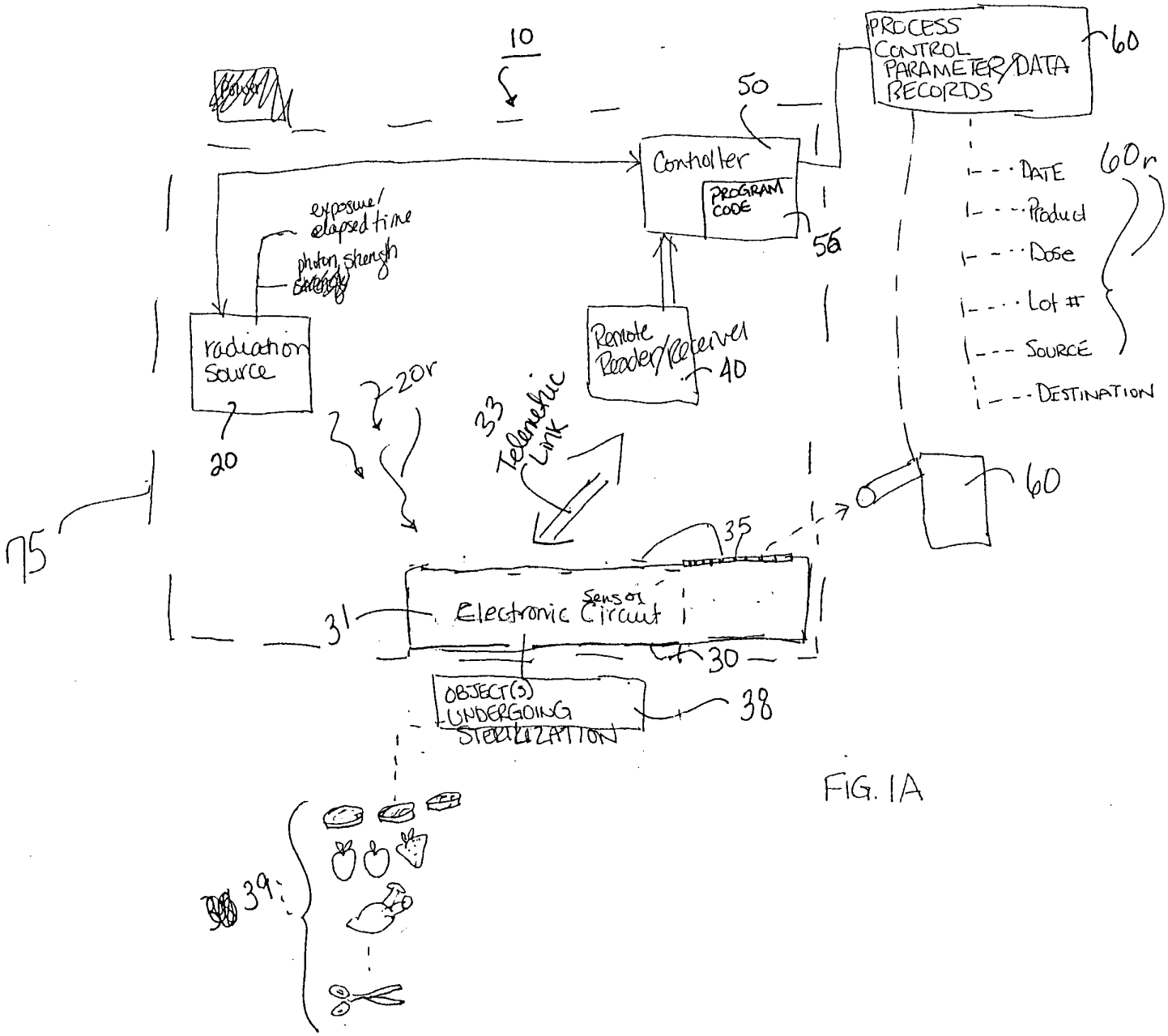


FIG. 1A

Figure 1B

List of Foods Approved for Irradiation in the USA

Product	Type of Clearance	Date	Dose Max (kGy)
Animal Feed and Pet Food	Unconditional	Sep-95	25.00
Apple	Unconditional	Apr-86	1.00
Apricot	Unconditional	Apr-86	1.00
Apricot (dried)	Unconditional	Apr-86	1.00
Avacado	Unconditional	Apr-86	1.00
Banana	Unconditional	Apr-86	1.00
Cherries	Unconditional	Apr-86	1.00
Chicken	Unconditional	May-90	3.00
Chicken Meat (Mechanically Seperated)	Unconditional	May-90	3.00
Currants, Red	Unconditional	Apr-86	1.00
Dates	Unconditional	Apr-86	1.00
Enzymes (Dehydrated)	Unconditional	Apr-86	10.00
Figs (Dried)	Unconditional	Apr-86	1.00
Fruit	Unconditional	Apr-86	1.00
Fruit/s (Dried)	Unconditional	Apr-86	1.00
Grapes	Unconditional	Apr-86	1.00
Guava	Unconditional	Apr-86	1.00
Herbs	Unconditional	Apr-86	30.00
Jujube (Dried)	Unconditional	Apr-86	1.00
Lemon	Unconditional	Apr-86	1.00
Litchi	Unconditional	Apr-86	1.00
Mandarin	Unconditional	Apr-86	1.00
Mango	Unconditional	Apr-86	1.00
Meat	Unconditional	Dec-97	4.50
Melon	Unconditional	Dec-97	7.00
Orange	Unconditional	Apr-86	1.00
Papaya	Unconditional	Apr-86	1.00
Potato	Unconditional	Jan-64	0.15
Pear	Unconditional	Apr-86	1.00
Persimmon	Unconditional	Apr-86	1.00
Pineapple	Unconditional	Apr-86	1.00
Plum	Unconditional	Apr-86	1.00
Pork	Unconditional	Jul-85	1.00
Poultry	Unconditional	Mar-90	3.00
Poultry Products	Unconditional	Mar-90	3.00
Raisins	Unconditional	Apr-86	1.00
Spices	Unconditional	Apr-86	30.00
Strawberry	Unconditional	Apr-86	1.00
Vegetables	Unconditional	Apr-86	1.00
Vegetables (Dried)	Unconditional	Apr-86	1.00
Vegetable Seasonings	Unconditional	Apr-86	30.00
Wheat	Unconditional	Jan-63	0.50
Wheat Flour	Unconditional	Jan-63	0.50
White Potatoes	Unconditional	Jan-64	0.15

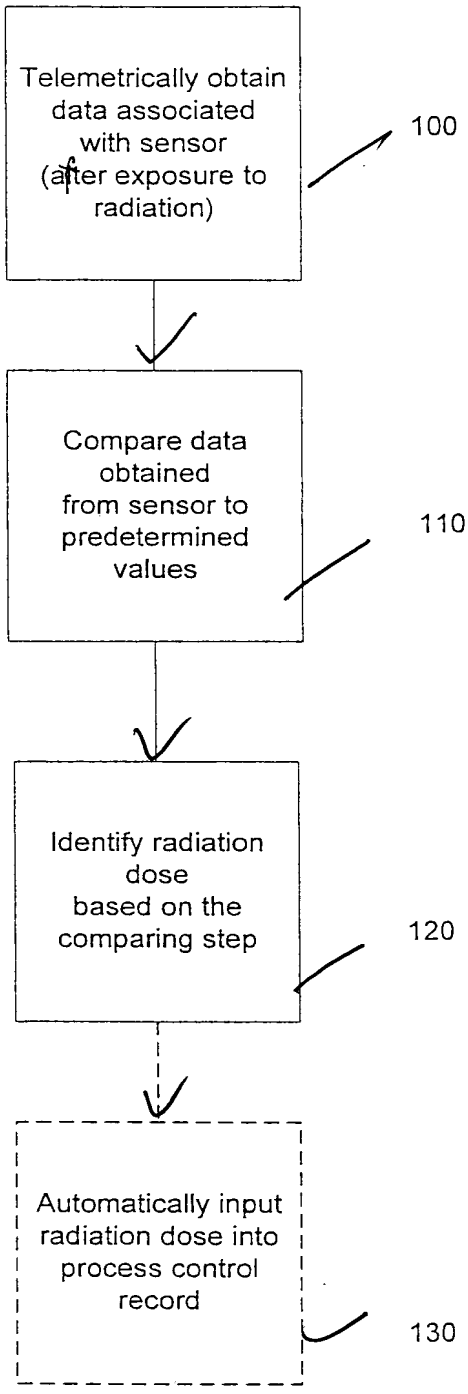

Telemetrically obtain data associated with sensor (after exposure to radiation)
100
Compare data obtained from sensor to predetermined values
110
Identify radiation dose based on the comparing step
120
Automatically input radiation dose into process control record
130

FIG. 2

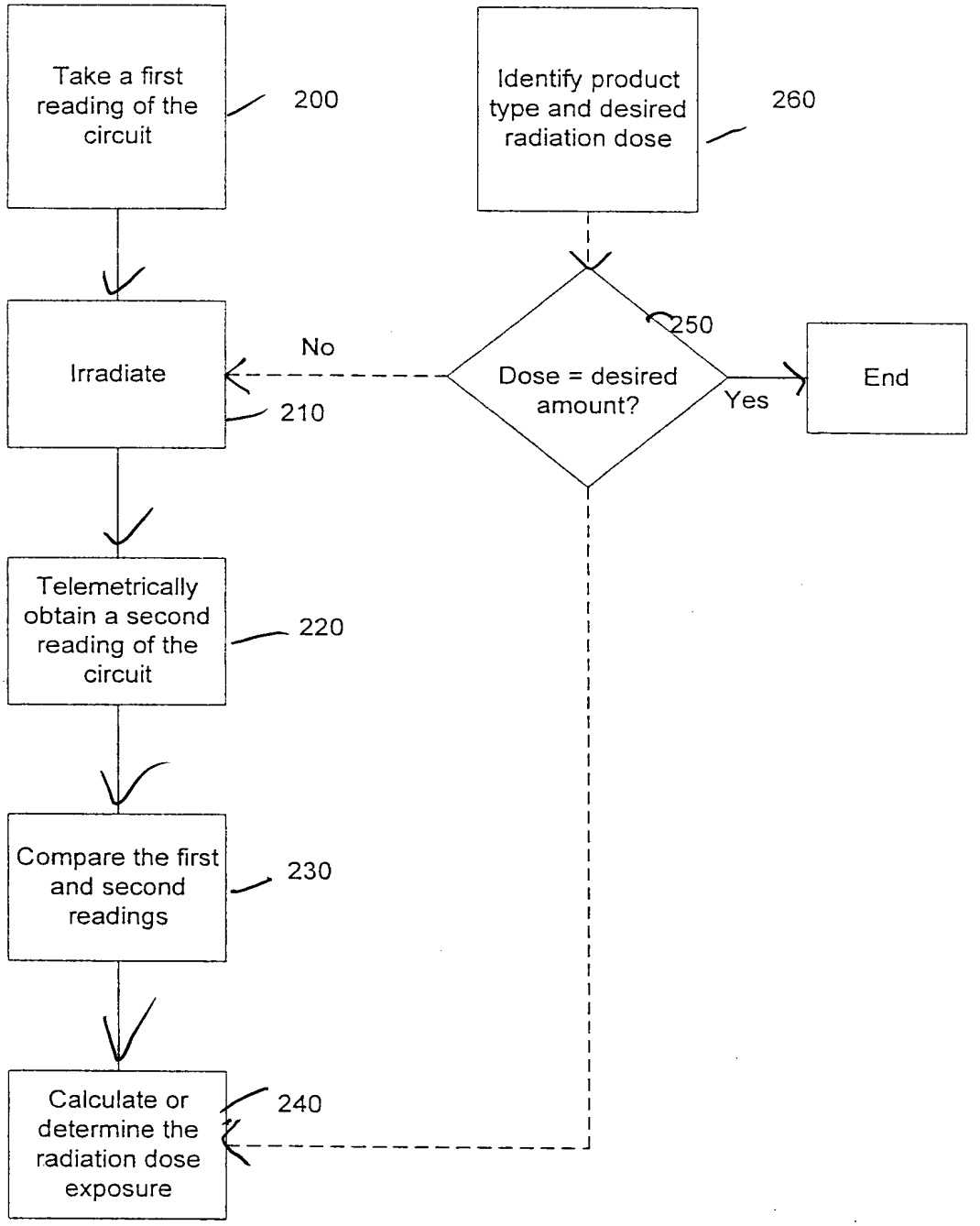
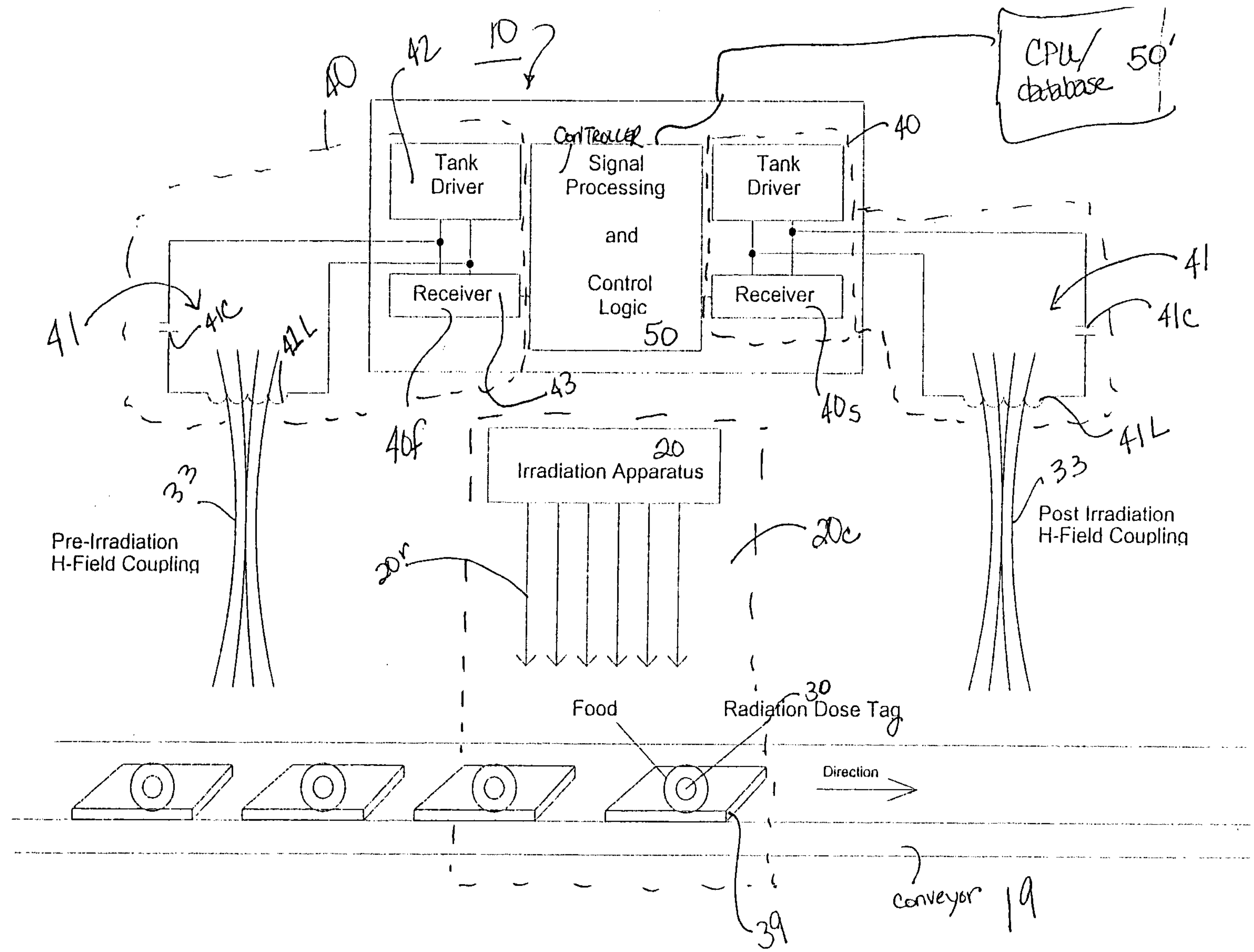

Take a first reading of the circuit
200
Identify product type and desired radiation dose
260
Irradiate
210
No
Dose = desired amount?
250
Yes
End
Telemetrically obtain a second reading of the circuit
220
Compare the first and second readings
230
Calculate or determine the radiation dose exposure
240

Fig. 3



10
20
42
40
CPU/ database
50'
Controller
Tank Driver
Signal Processing
and
Control Logic
50
Tank Driver
Receiver
Receiver
41
41C
41L
43
40f
40s
41
41c
41L
20
Irradiation Apparatus
33
Pre-Irradiation H-Field Coupling
33
Post Irradiation H-Field Coupling
20r
20c
Food
30
Radiation Dose Tag
Direction
conveyor
19
39

Figure 4

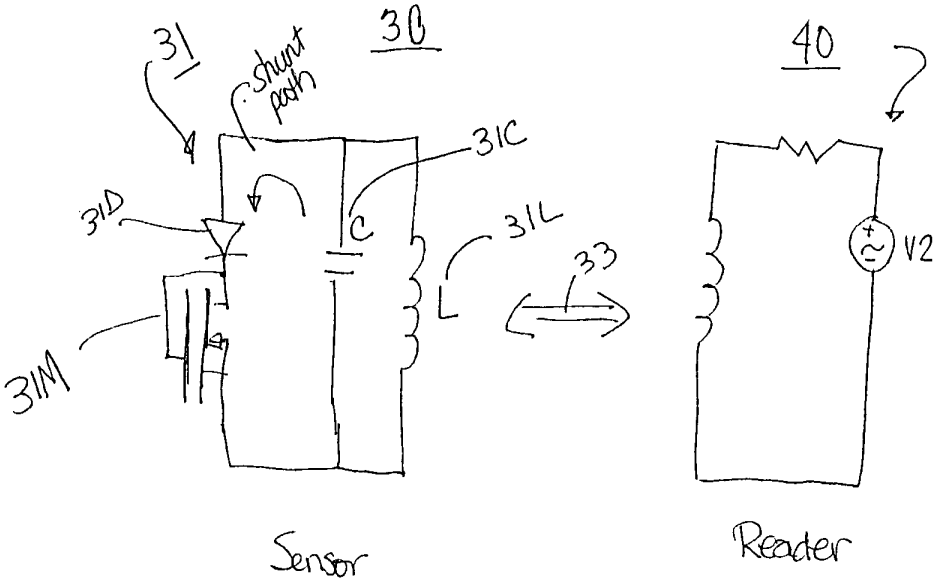

31
shunt path
30
40
31C
31D
C
31L
33
L
V2
31M
Sensor
Reader

Figure 5:A

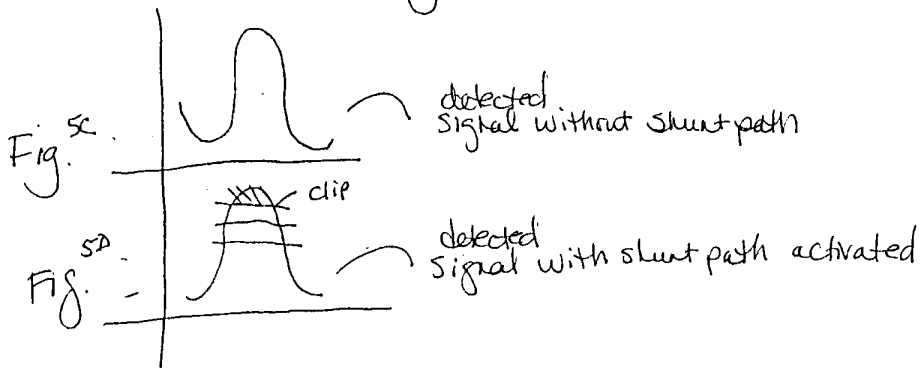


Fig. 5C
detected signal without shunt path
clip
Fig. 5D
detected signal with shunt path activated

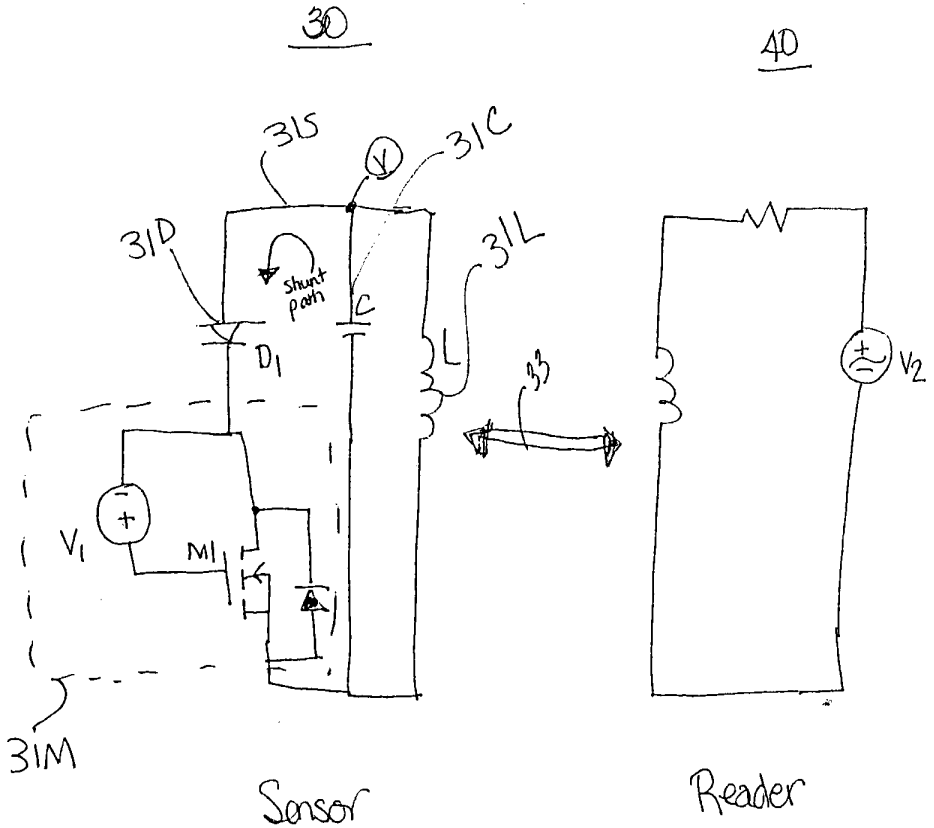

30
40
31S
31C
31D
31L
shunt path
C
L
D_1
33
V_2
V_1
M1
31M
Sensor
Reader

Figure 5B

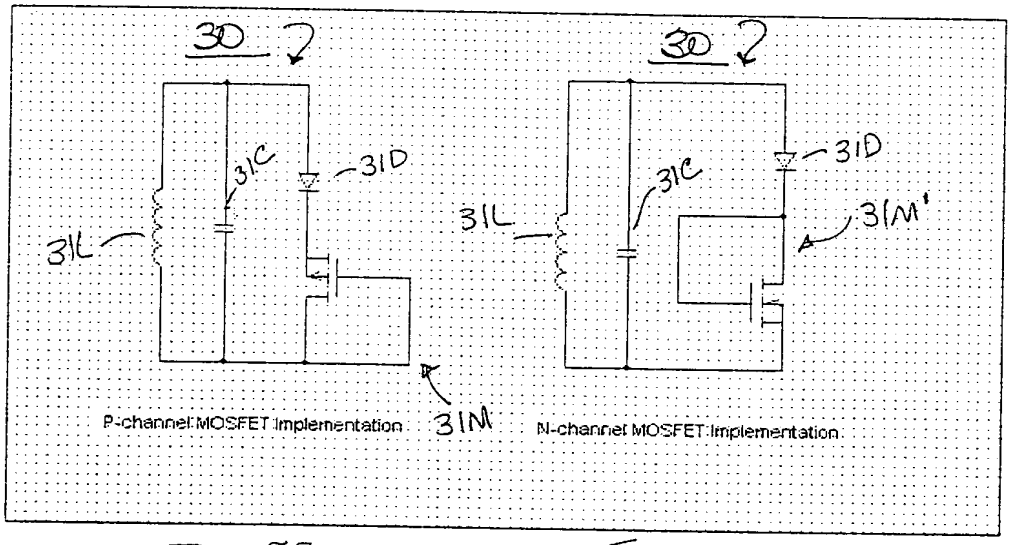

30
31C
31D
31L
31M
P-channel MOSFET Implementation
30
31C
31D
31L
31M'
N-channel MOSFET Implementation

Fig. 5E

Fig. 5F

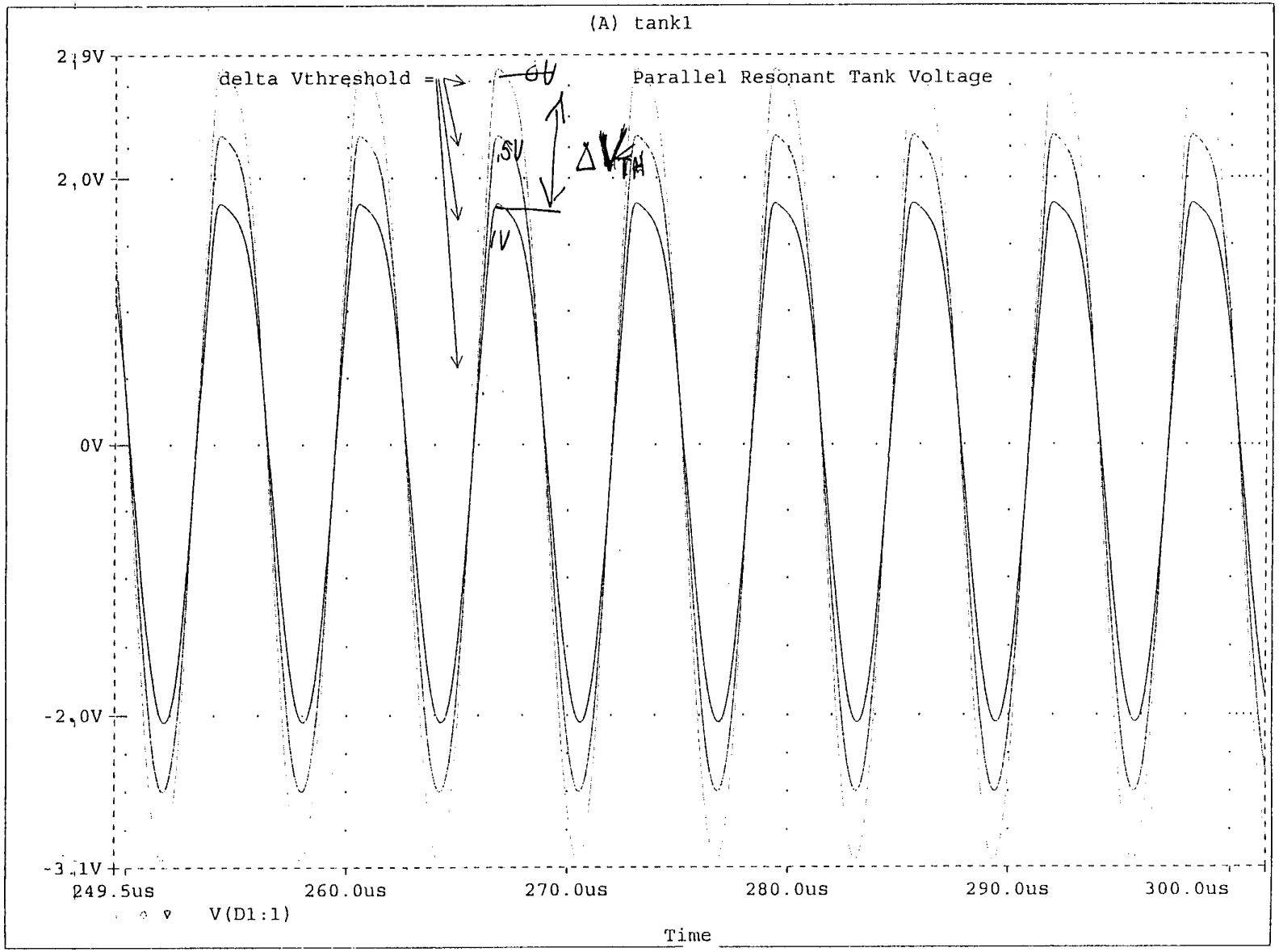


Figure 6A

N channel

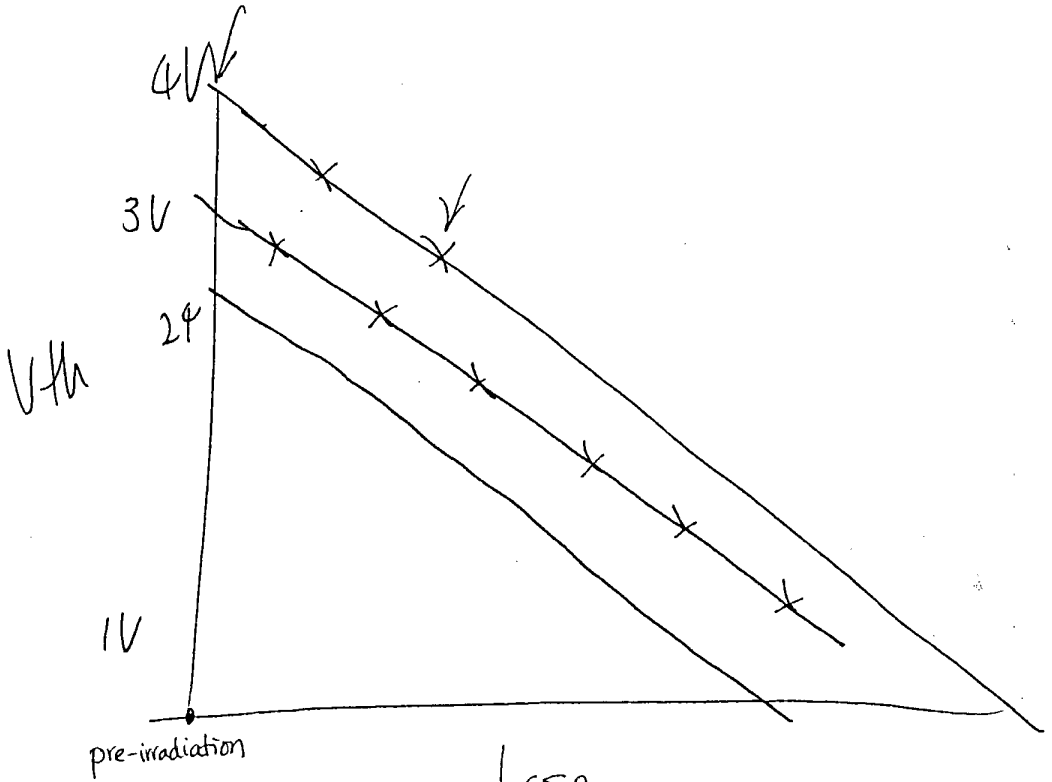


Figure 6B

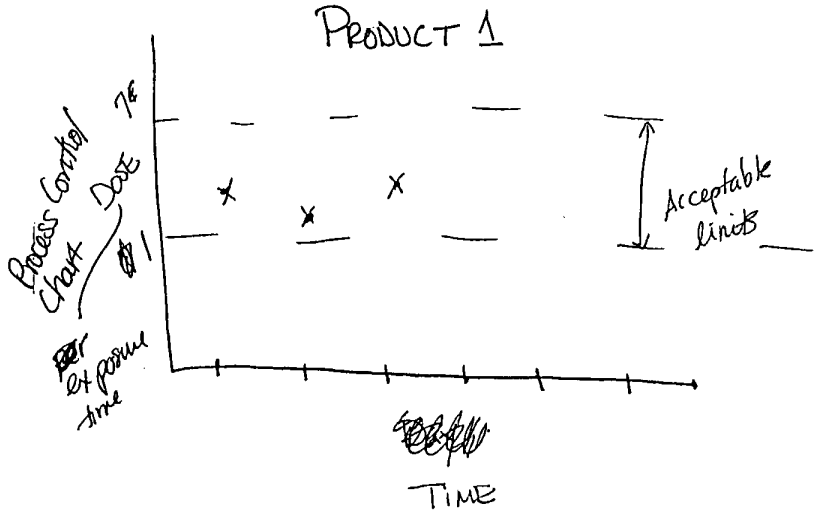


FIG. 7A

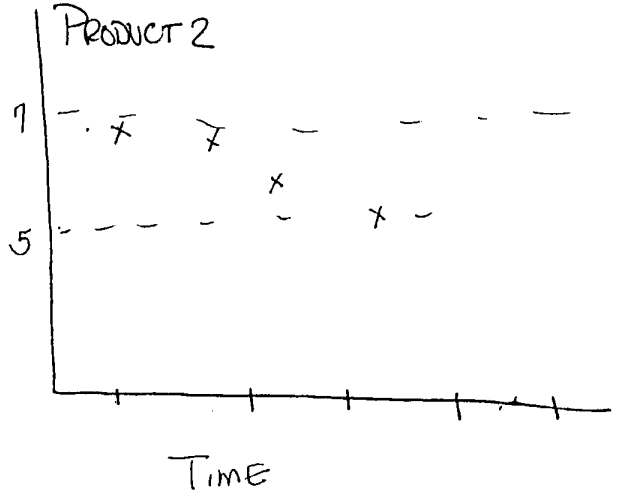


FIG. 7B

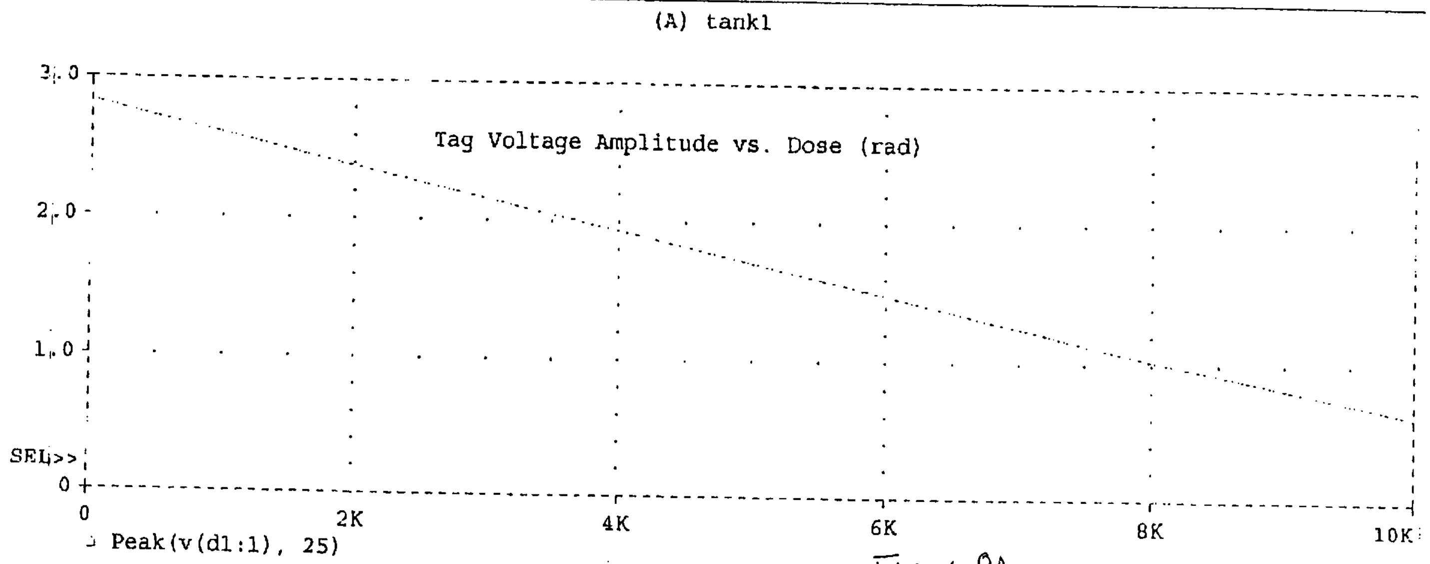


Figure 8A

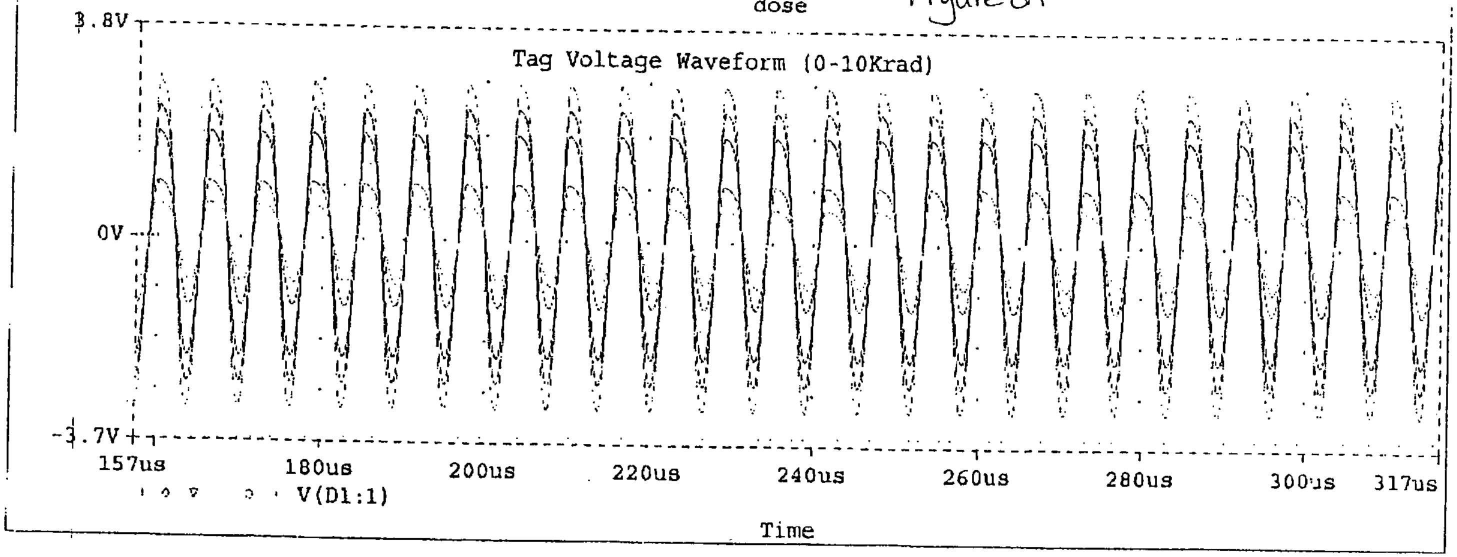


Figure 8B

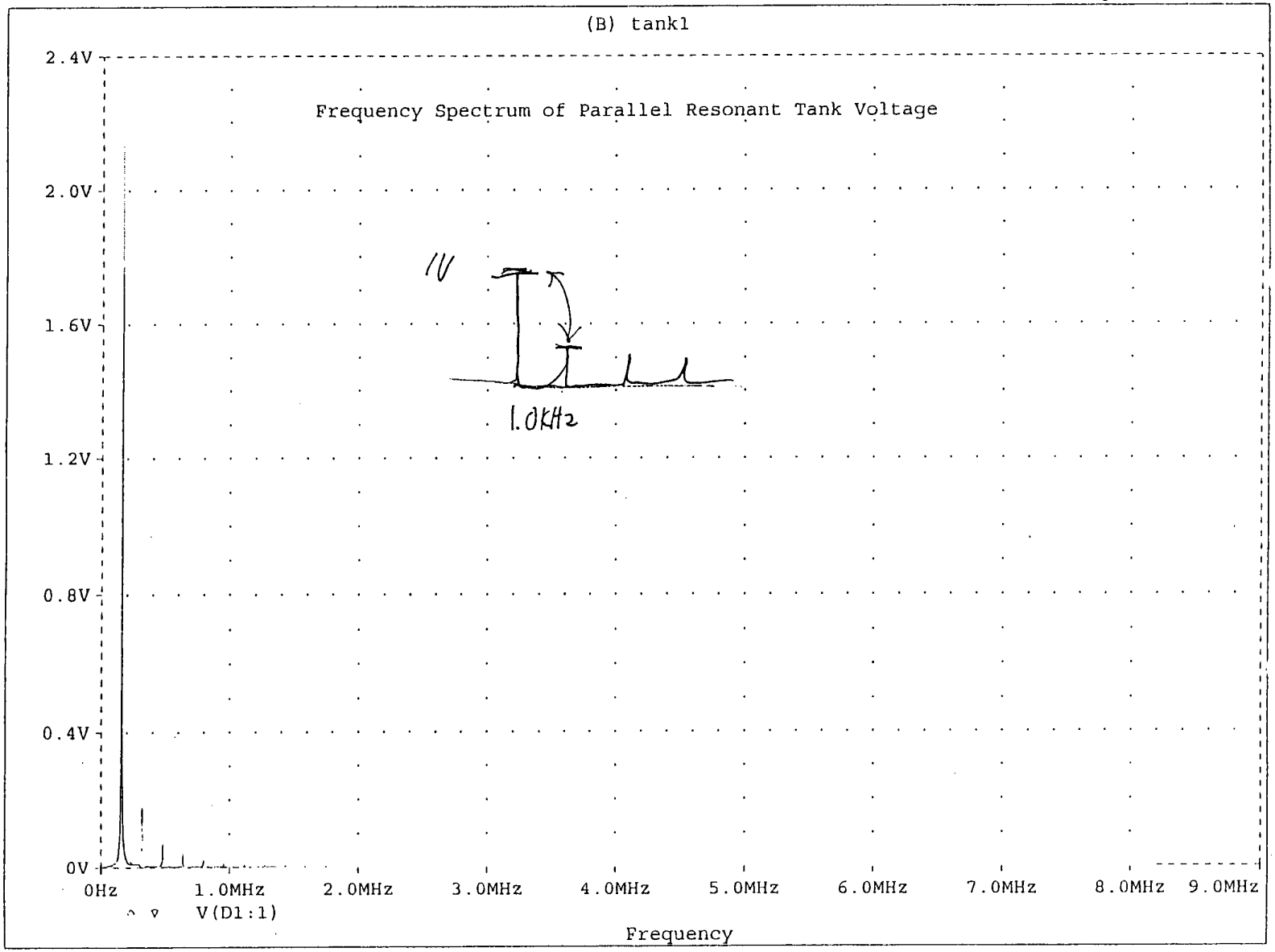

(B) tank1
Frequency Spectrum of Parallel Resonant Tank Voltage
2.4V
2.0V
1.6V
1.2V
0.8V
0.4V
0V
1V
1.0KHz
0Hz
1.0MHz
2.0MHz
3.0MHz
4.0MHz
5.0MHz
6.0MHz
7.0MHz
8.0MHz
9.0MHz
V(D1:1)
Frequency

Figure 9A

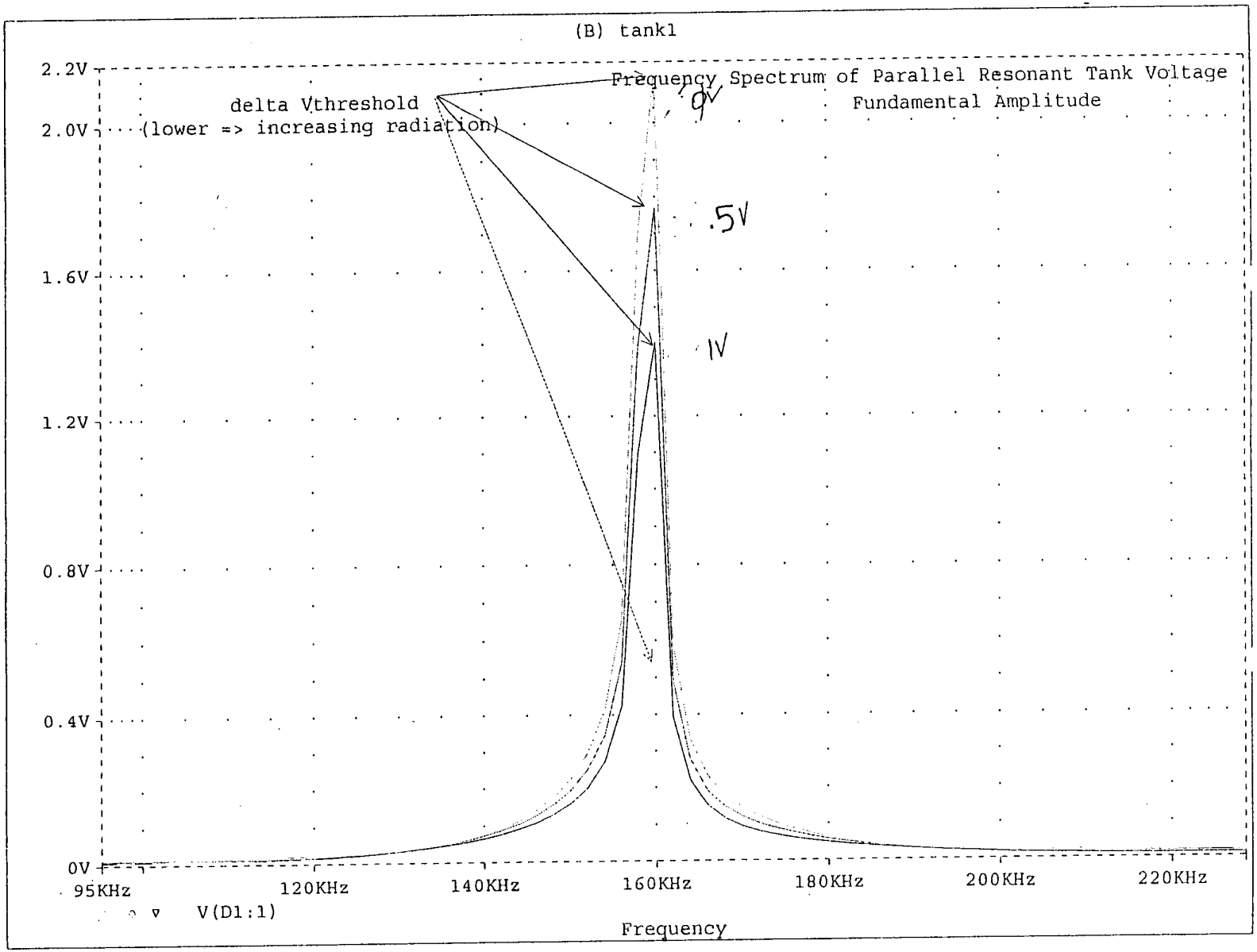


Figure 9B

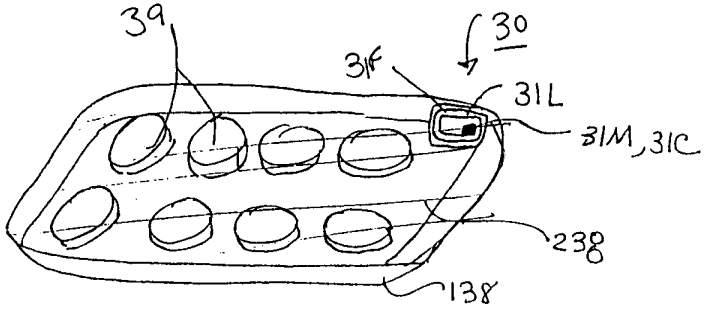


Figure 10

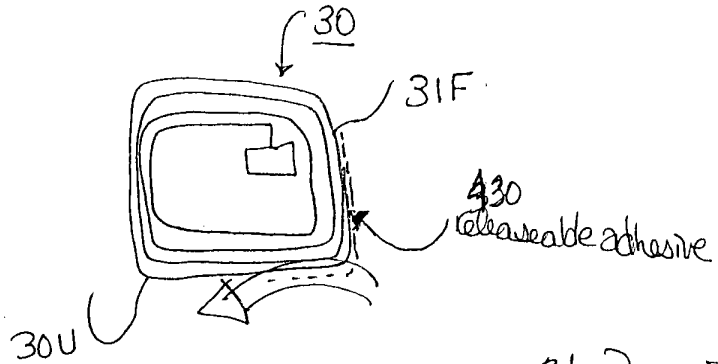


Figure 11A

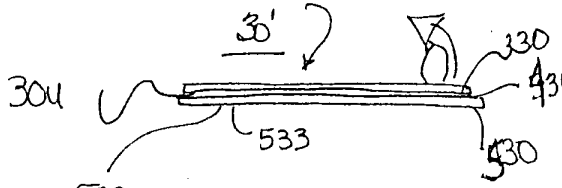


Figure 11B

Figure 11C

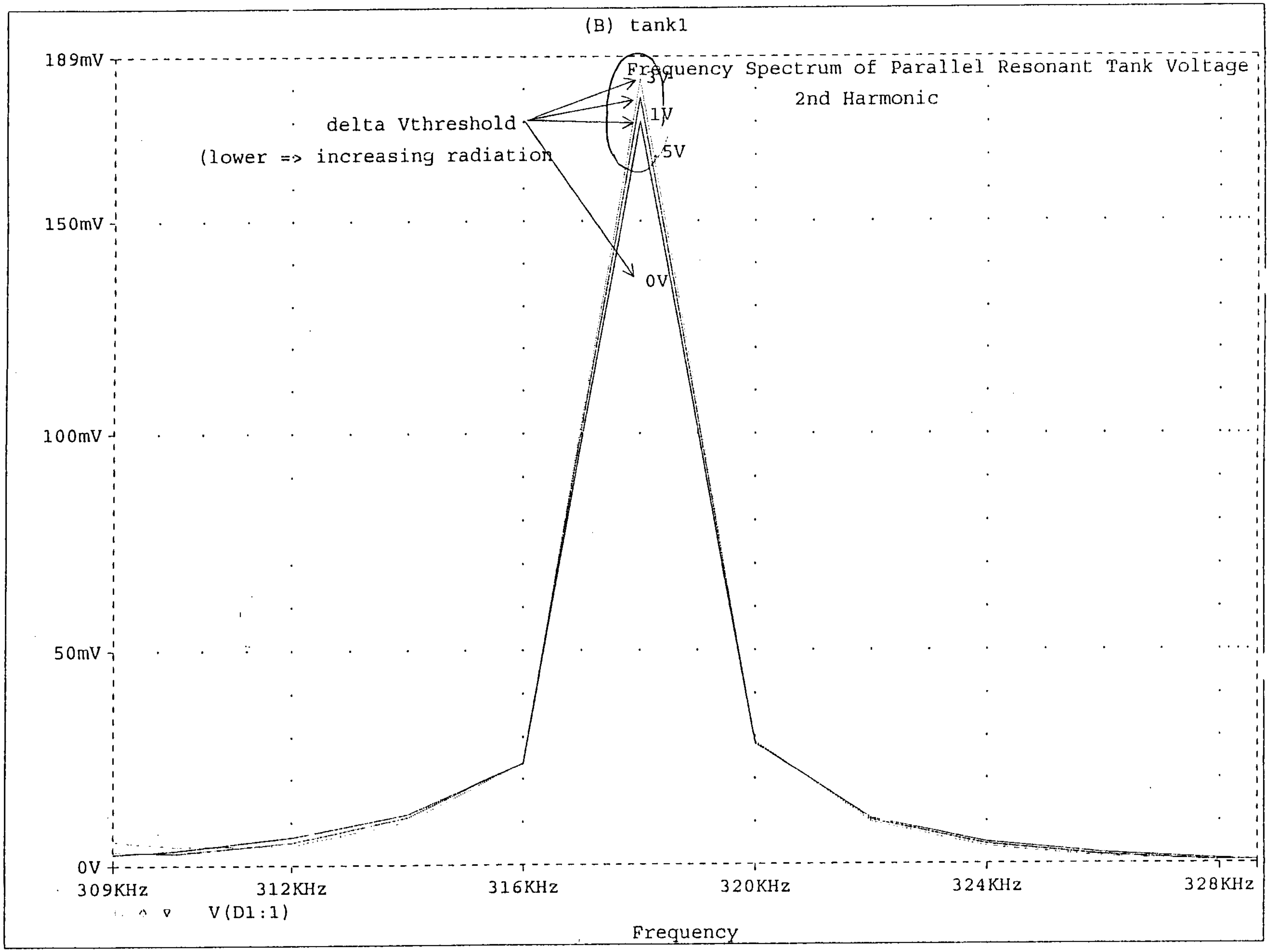

(B) tank1
Frequency Spectrum of Parallel Resonant Tank Voltage
2nd Harmonic
delta Vthreshold
(lower => increasing radiation
3V
1V
.5V
0V
189mV
150mV
100mV
50mV
0V
309KHz
312KHz
316KHz
320KHz
324KHz
328KHz
V(D1:1)
Frequency

Figure 9C

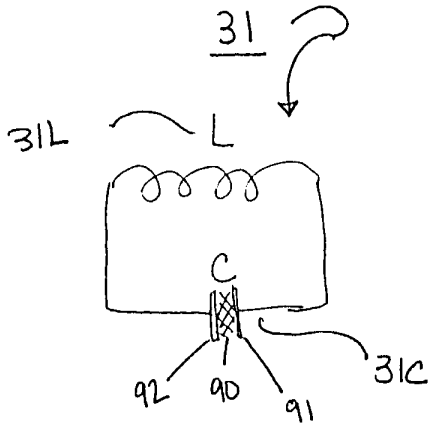


Fig. 12A

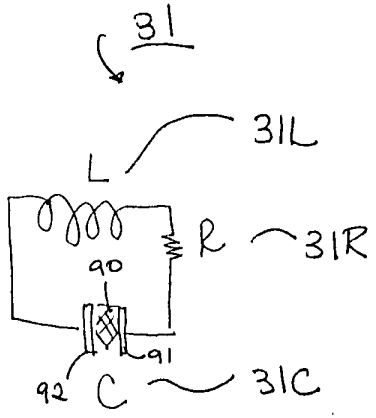


Fig. 12B

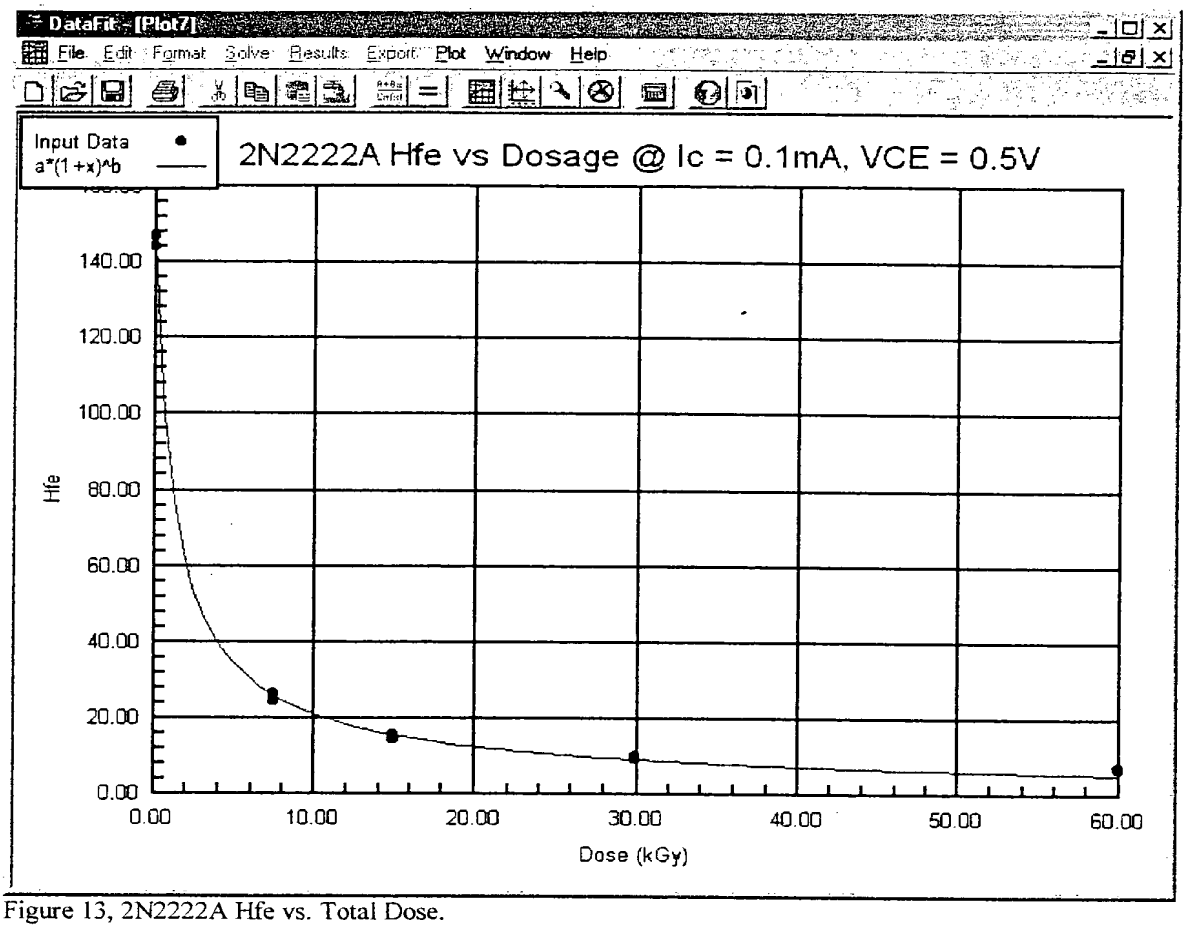


Figure 13, 2N2222A Hfe vs. Total Dose.

Figure 13

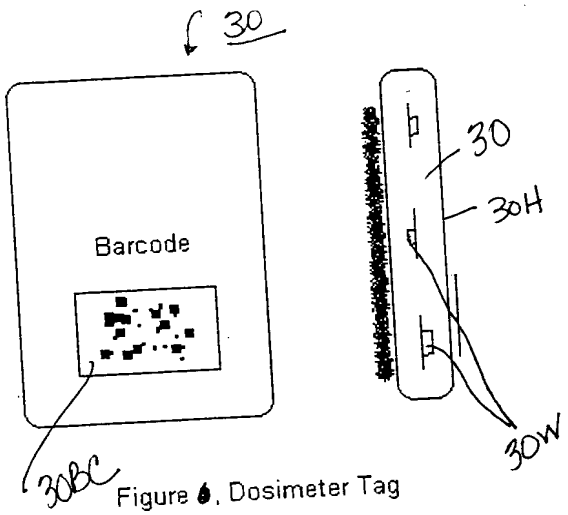


Figure 6, Dosimeter Tag

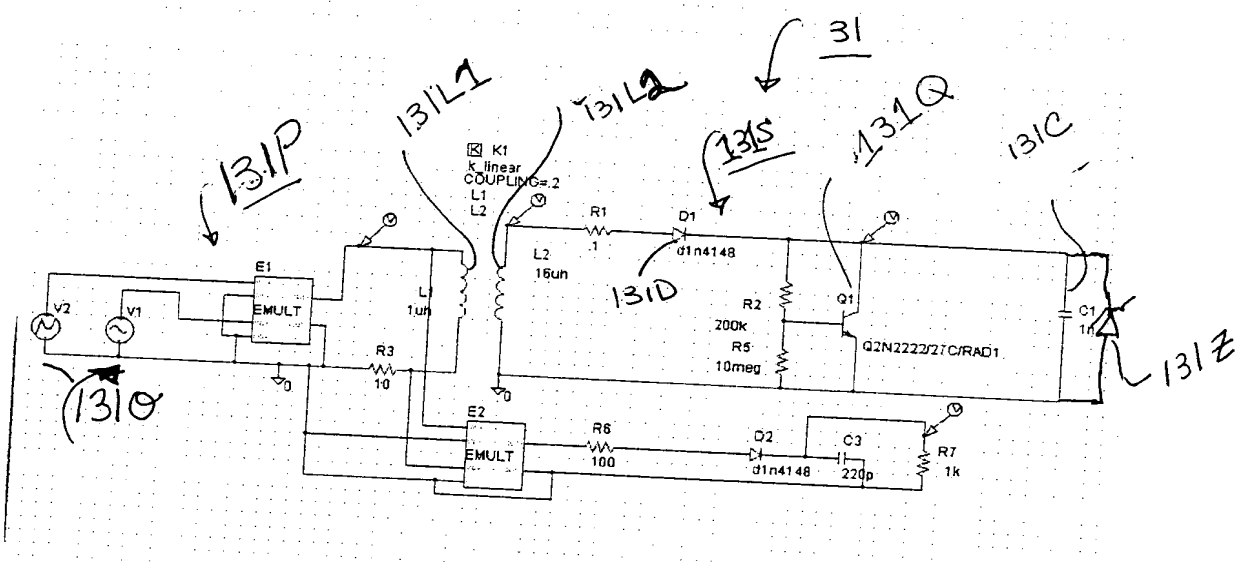


Fig. 17

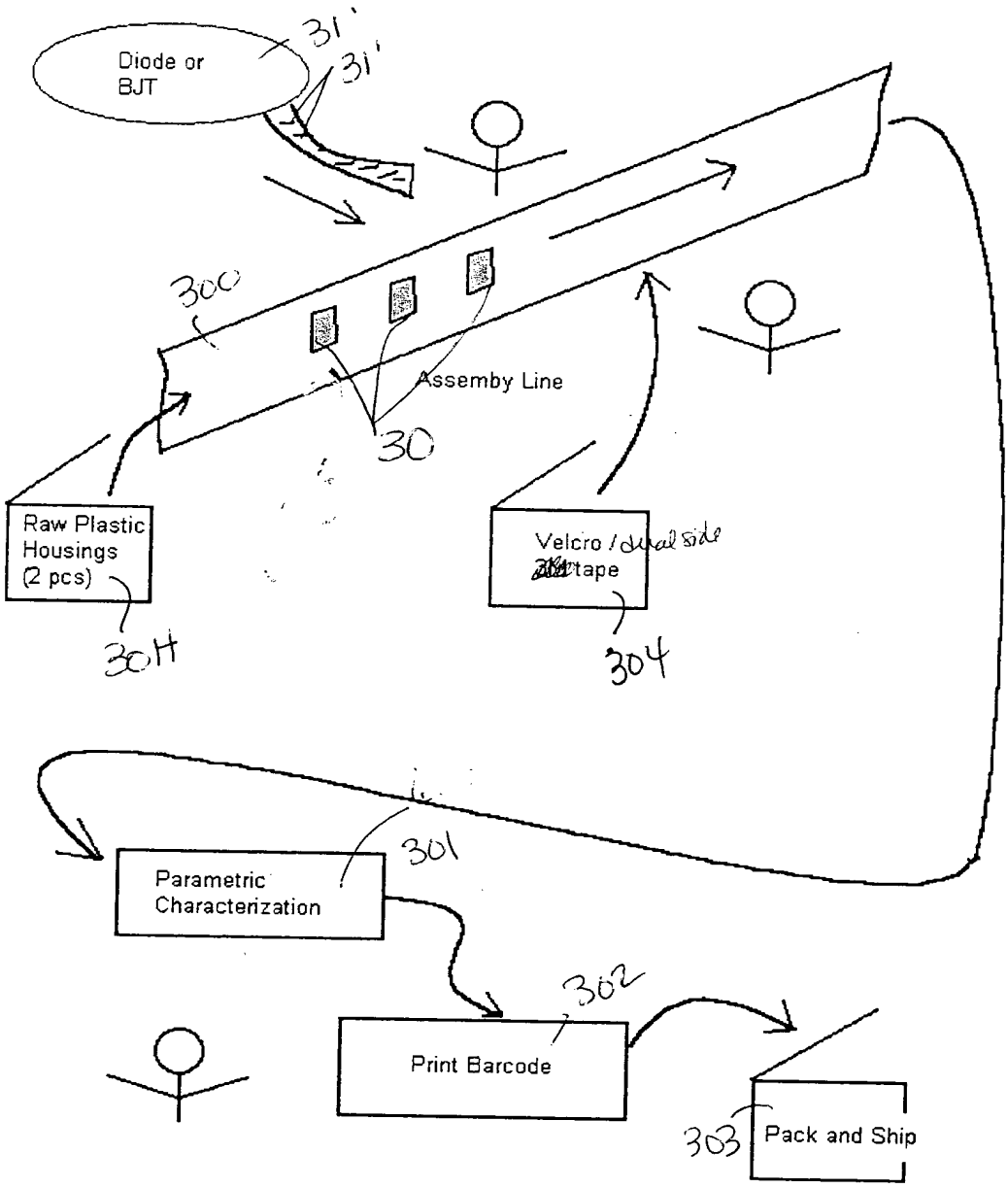


Figure 1. Tag Manufacture

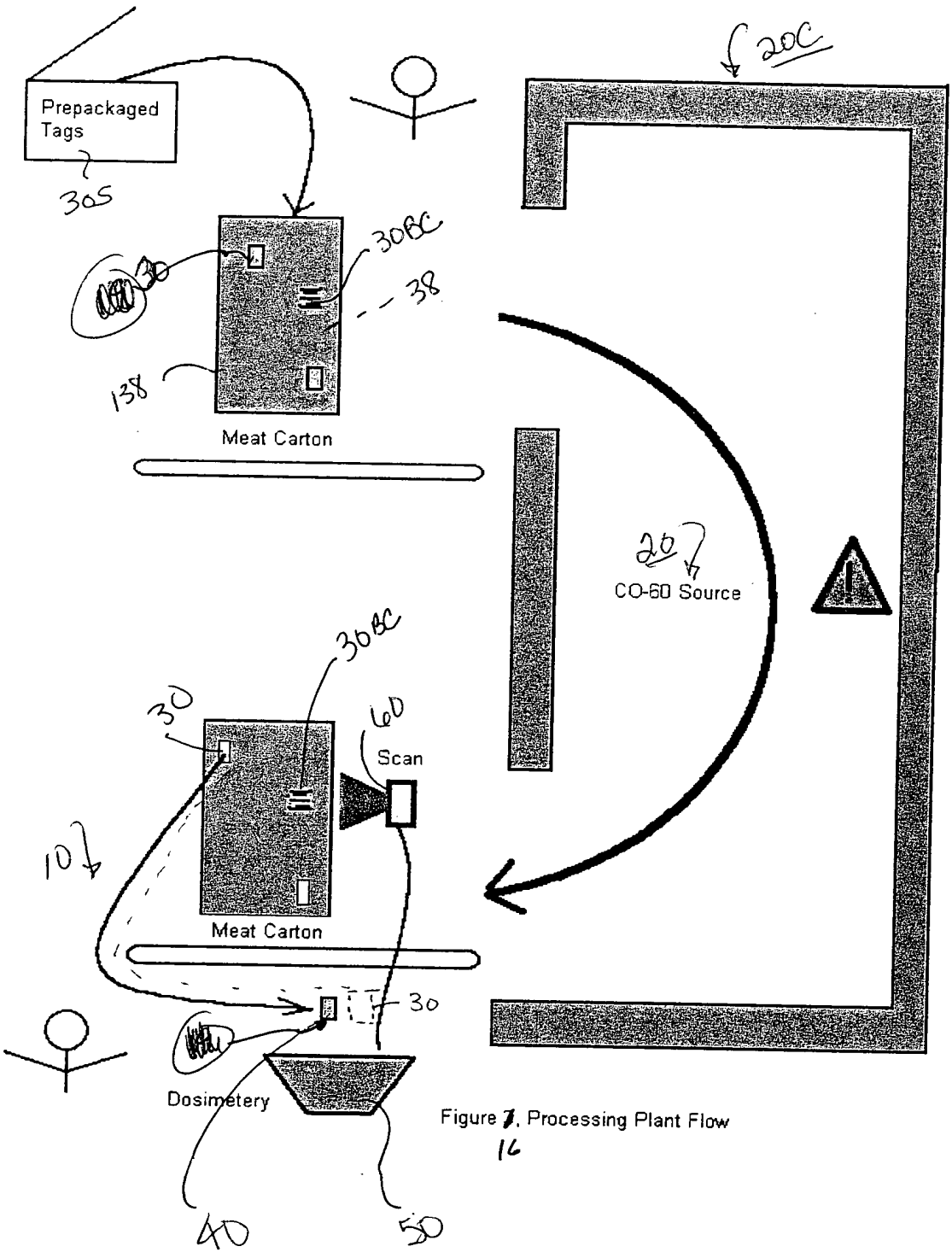


Figure 1. Processing Plant Flow

16

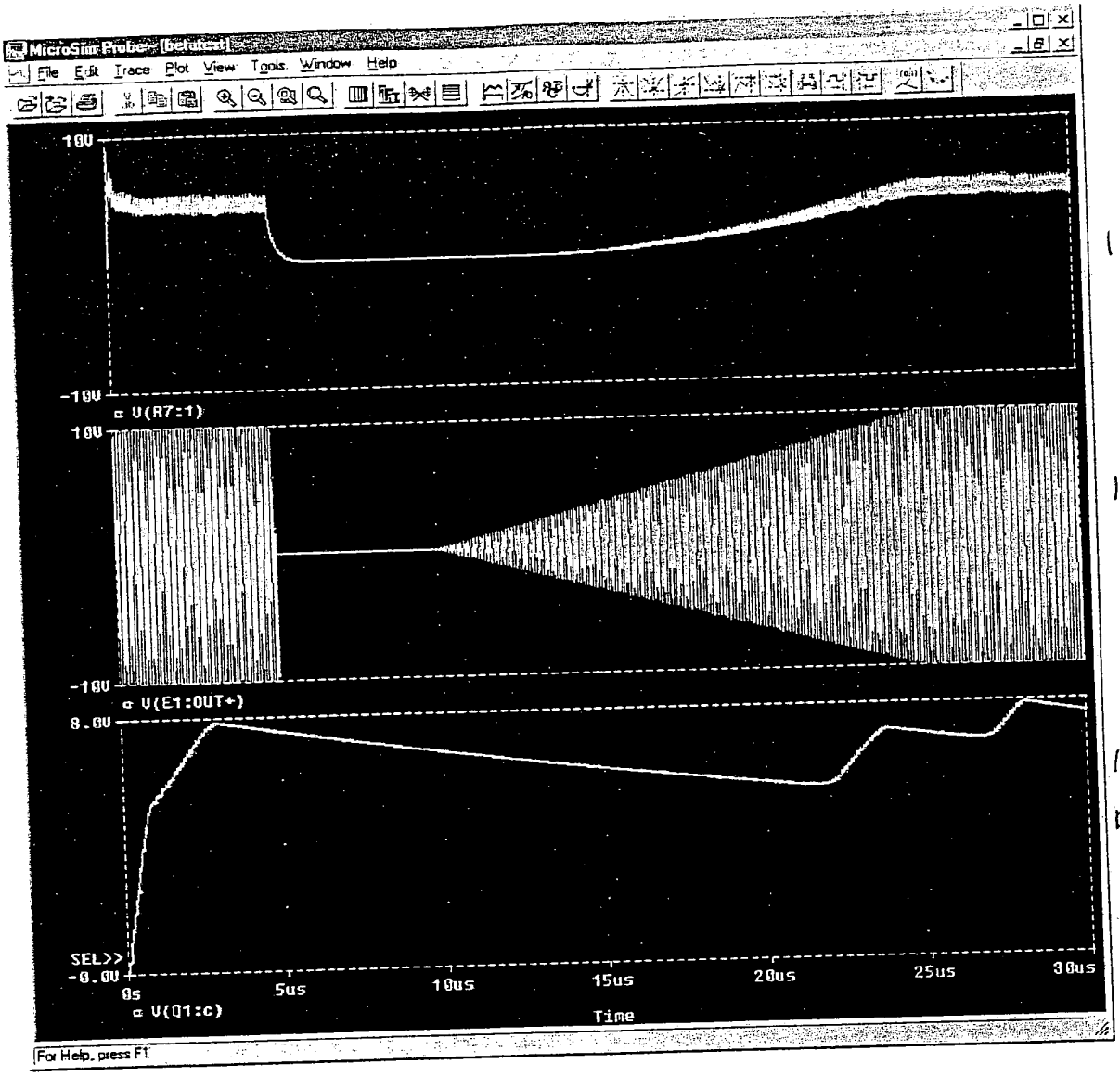


Figure 18, Operational waveforms.
18A-18C

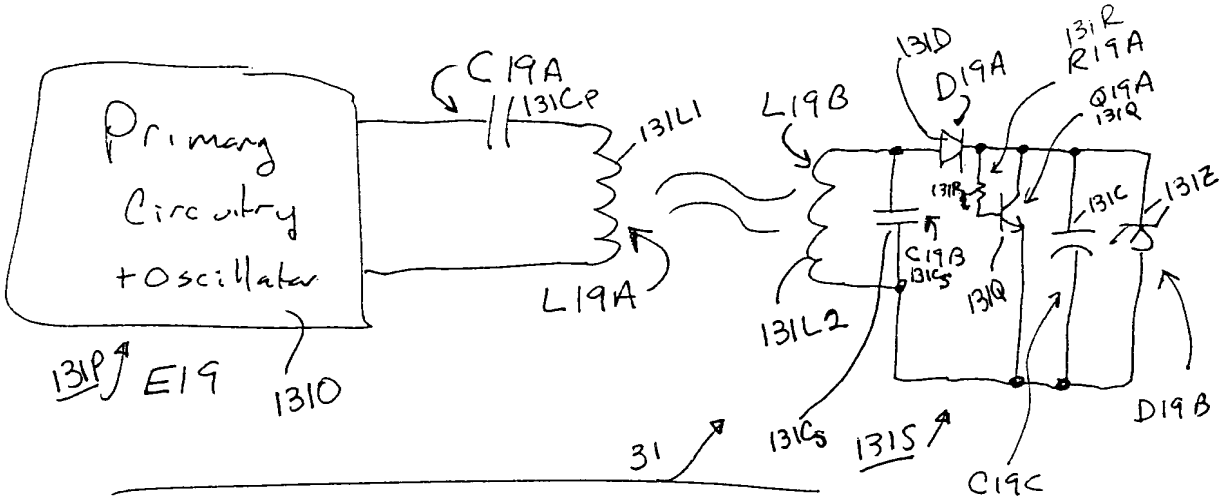


Figure 19

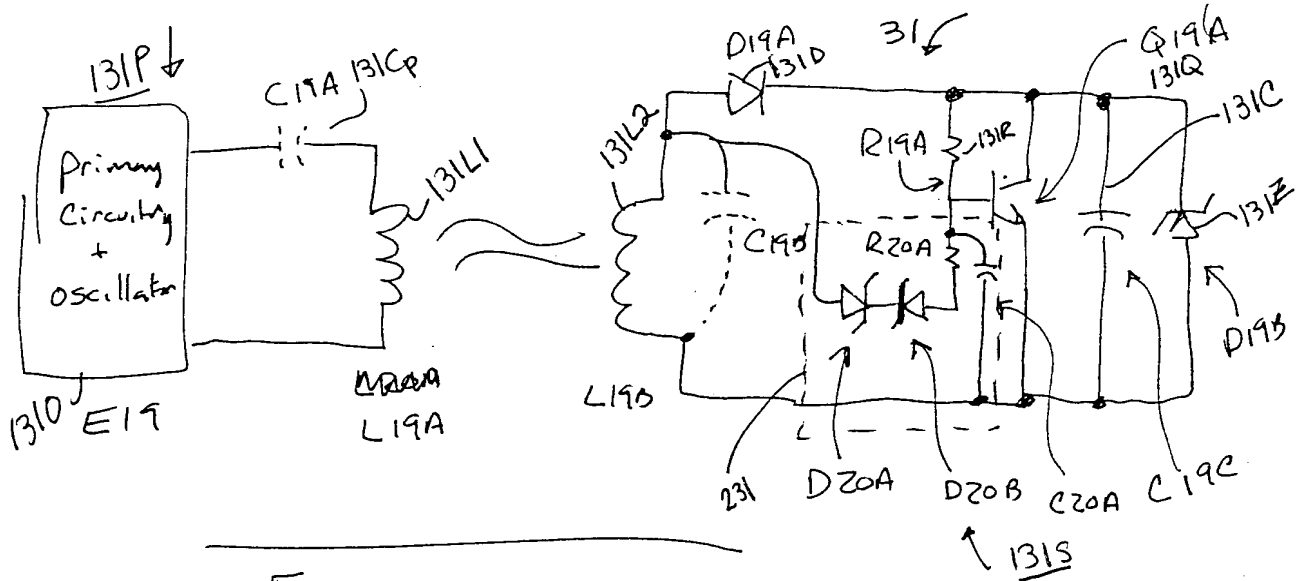
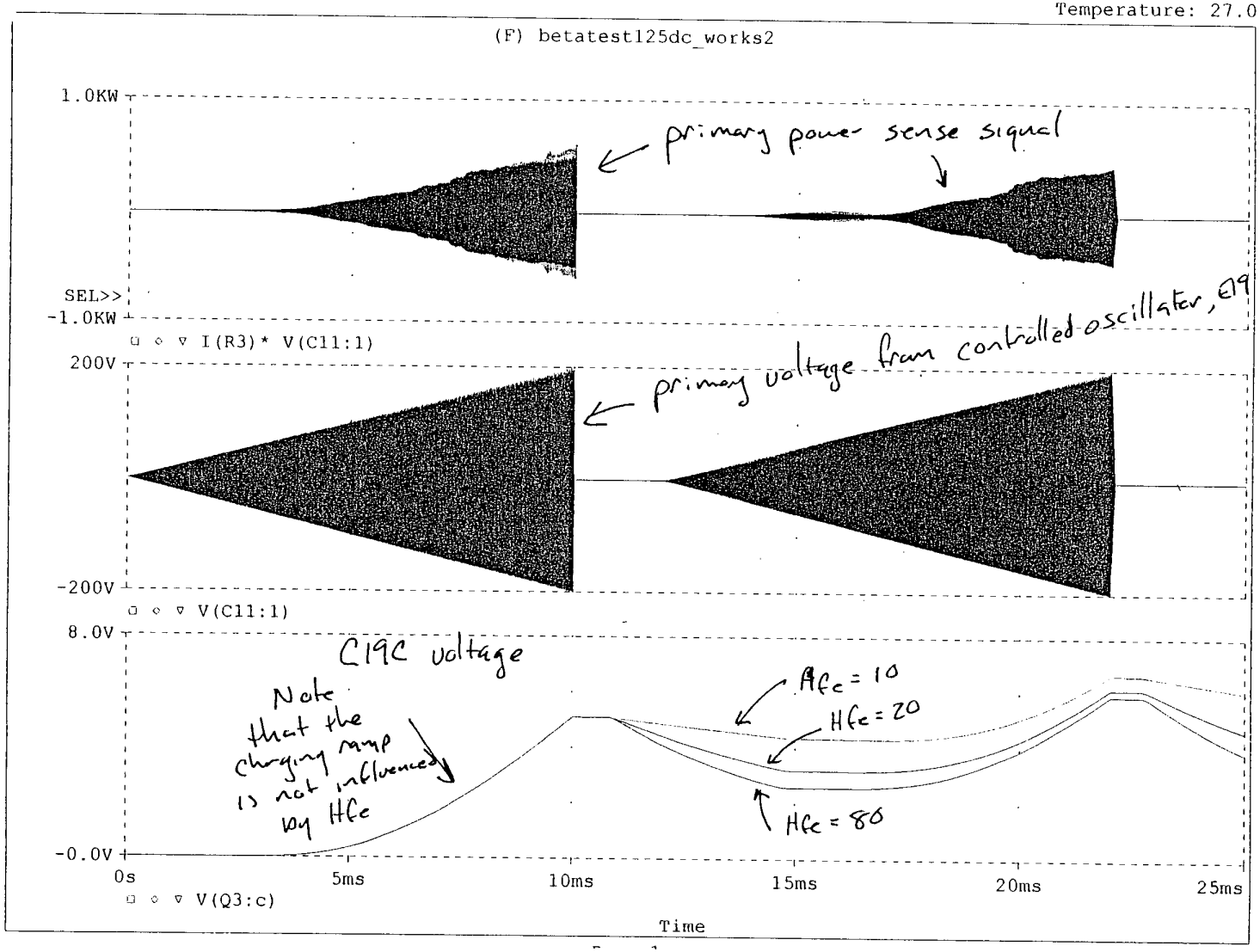


Figure 20.



Figures21A-C

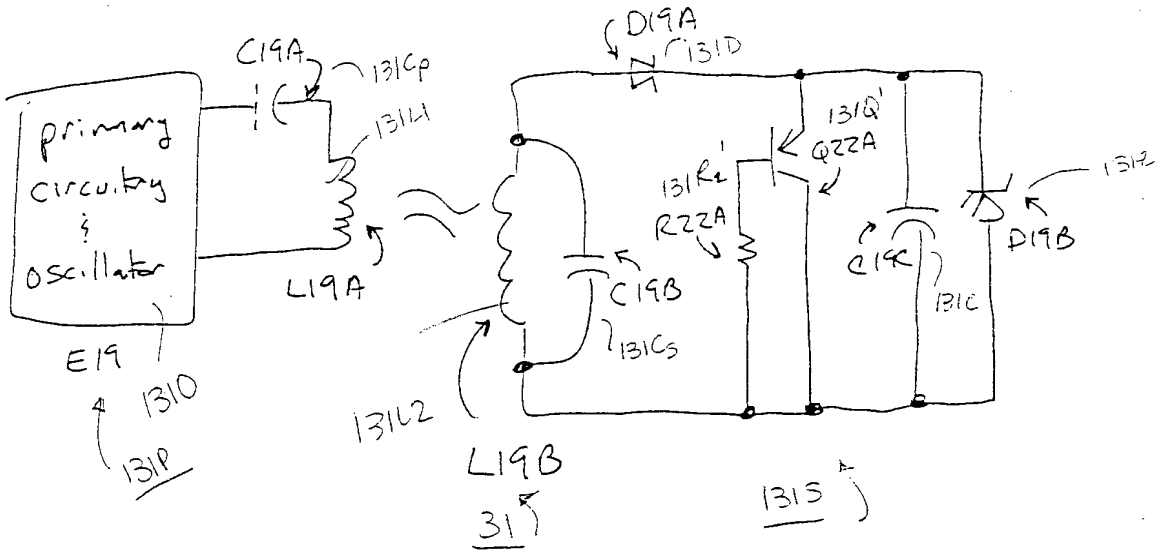


Figure 22

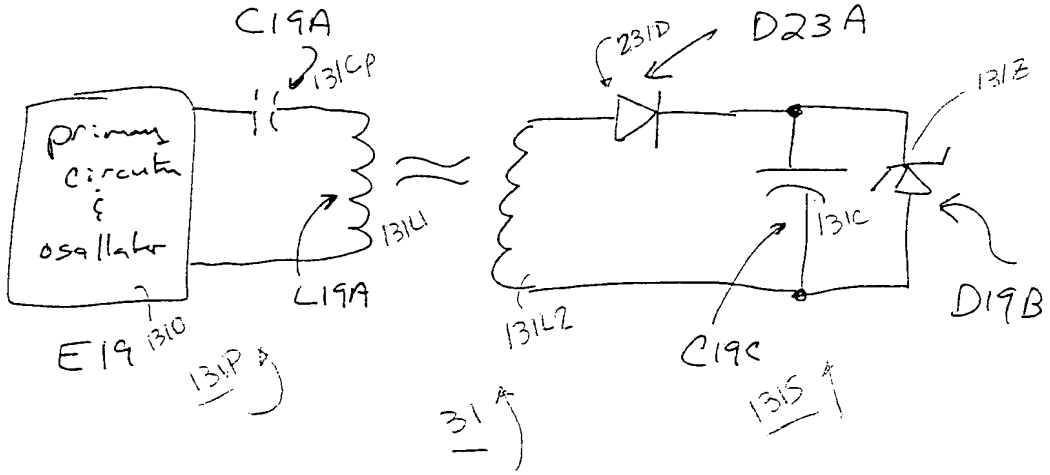
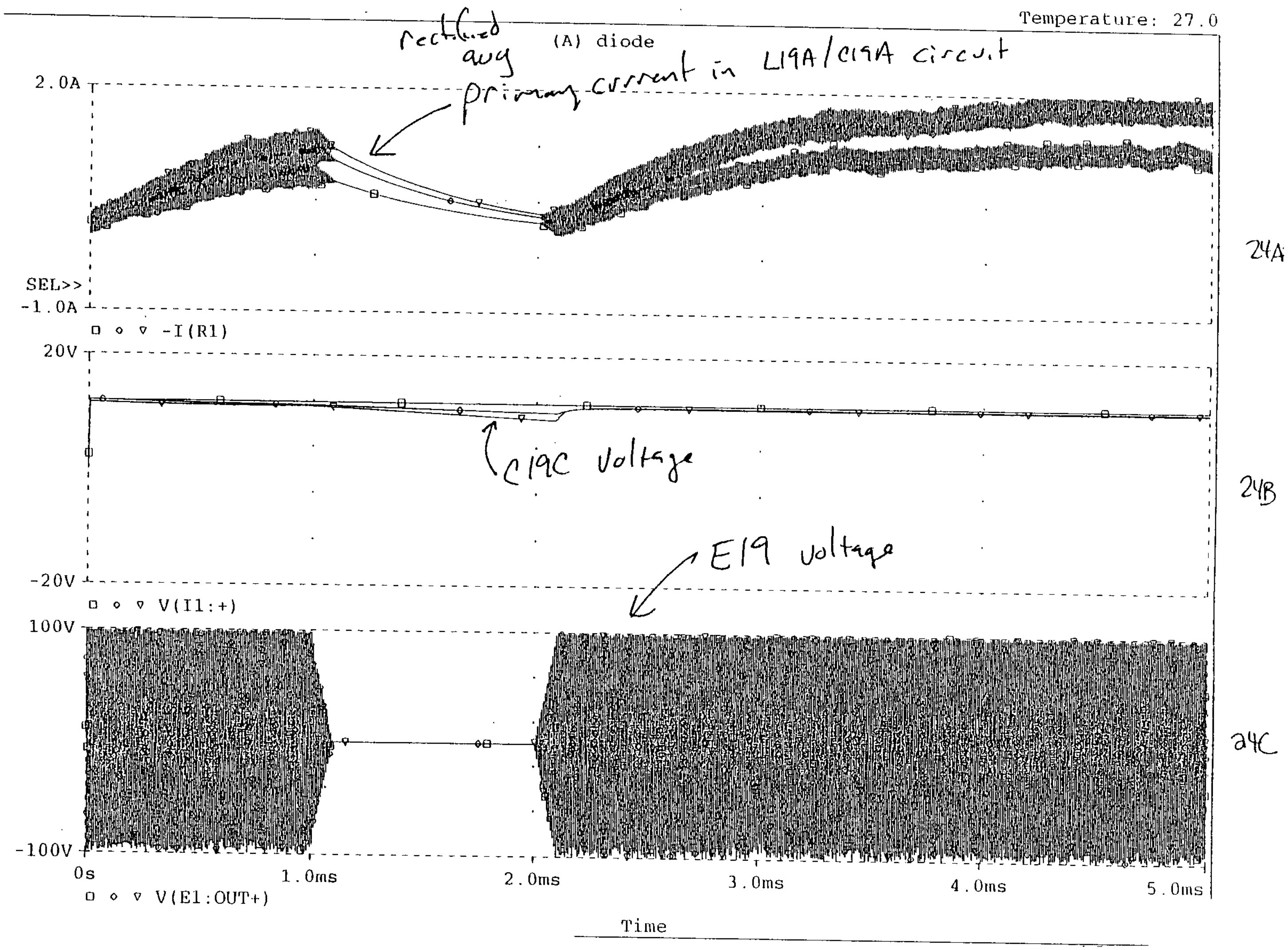


Figure 23



Figures 24A-C

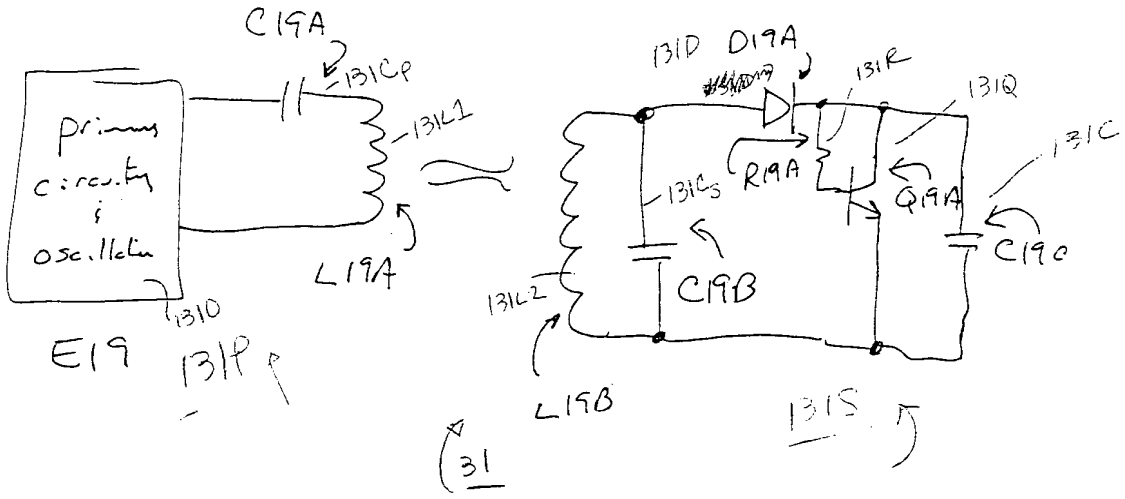


Figure 25

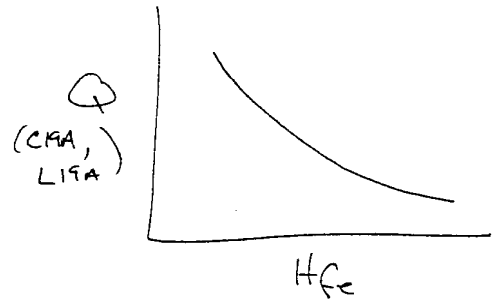


Figure 26.

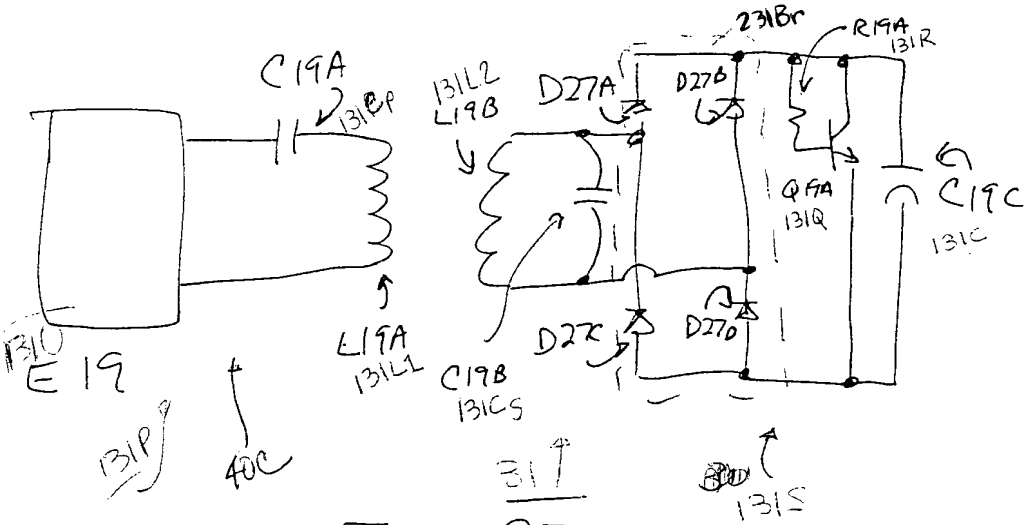


Figure 27

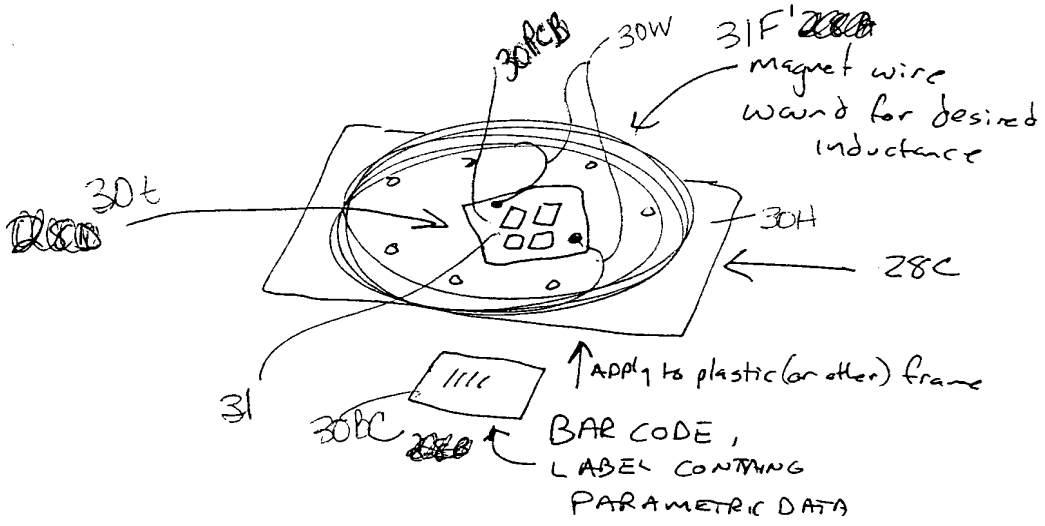


Figure 28, DOSIMETRY TAG